CI/SfB
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BBA BRITISH BOARD OF AGRÉMENT
ASSESSMENT OF PRODUCTS FOR CONSTRUCTION

Designated by Government to issue European Technical Approvals

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Agrément Certificate No 98/3448

ULTRAFRAME CONSERVATORY ROOF SYSTEM

Système de serre
Gewächshaussystem

Product

- *THIS CERTIFICATE RELATES TO THE ULTRAFRAME CONSERVATORY ROOF SYSTEM.*
- *The roof system referred to in the Detail Sheet is fabricated and marketed by the Certificate holder at the above address.*
- *The roof system is for conservatories used as extensions to new or existing buildings where an external grade door separates conservatory from inner room.*
- *It is essential that the roof system is installed and used in accordance with the conditions set out in the* Design Data *and* Installation *parts of the relevant Detail Sheet.*

Building Regulations — Detail Sheet 1

1 The Building Regulations 1991 (as amended 1994 and 1997) (England and Wales)

The Secretary of State has agreed with the British Board of Agrément that the extension of a building by the addition at ground level of a conservatory, where the floor area does not exceed 30 m^2, is exempt from the Building Regulations.

2 The Building Standards (Scotland) Regulations 1990 (as amended)

A conservatory forming a single-storey extension to an existing dwelling of purpose sub-group 1B or 1C, where the conservatory does not contain a flue or heat-producing appliance, is not within one metre of a boundary and the floor area does not exceed 30 m^2, is exempt from these Regulations.

3 The Building Regulations (Northern Ireland) 1994 (as amended 1995 and 1997)

A conservatory constructed as an annexe to an existing building and having a floor area not exceeding 30 m^2 and not less than 1 m from any boundary is exempt from these Regulations provided that the conditions described in A5 Exemptions are met.

Conditions of Certification

4 Conditions

4.1 Where reference is made in this Certificate to any Act of Parliament, Regulation made thereunder, Statutory Instrument, Code of Practice, British Standard, manufacturer's instruction or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this Certificate.

4.2 The quality of materials and the method of manufacture have been examined and found satisfactory by the BBA and must be maintained to this standard during the period of validity of this Certificate. This Certificate will remain valid for an unlimited period provided:

(a) the specification of the product is unchanged; and

(b) the manufacturer continues to have the product checked by the BBA.

4.3 This Certificate will apply only to the product that is installed, used and maintained as set out in this Certificate.

4.4 In granting this Certificate, the BBA makes no representation as to:

(a) the presence or absence of patent or similar rights subsisting in the product; and

(b) the legal right of the Certificate holder to market, install or maintain the product; and

(c) the nature of individual installations of the product, including methods and workmanship.

4.5 It should be noted that any recommendations relating to the safe use of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory or Common Law duties of care, or of any duty of care which exist at the date of this Certificate or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory or Common Law duties of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the use of this product.

BBA BRITISH BOARD OF AGRÉMENT
ASSESSMENT OF PRODUCTS FOR CONSTRUCTION

In the opinion of the British Board of Agrément, the Ultraframe Conservatory Roof System is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 98/3448 is accordingly awarded to Maitland Conservatory Roofs.

On behalf of the British Board of Agrément

Date of issue: 10th August 1998

Director

Associated Detail Sheets

The following Detail Sheets are part of this Certificate:

Detail Sheet	Edition	Date of issue	No of pages	Imprint ref	Title	System status
2	1	31st March 1998	8	01UFC2	Ultraframe Victorian Conservatory Roof System	Current

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BBA BRITISH BOARD OF AGRÉMENT
ASSESSMENT OF PRODUCTS FOR CONSTRUCTION

THE ULTRAFRAME VICTORIAN CONSERVATORY ROOF SYSTEM

DETAIL SHEET 2
Edition 1
No of pages 8

Product

• *THIS DETAIL SHEET RELATES TO THE ULTRAFRAME VICTORIAN CONSERVATORY ROOF SYSTEM.*

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, and the Conditions of Certification, *respectively.*

Technical Specification

1 Description

1.1 The Ultraframe Victorian Conservatory Roof System is designed and fabricated for use in the exposure conditions described in this Certificate.

1.2 The roof system is of aluminium construction with white PVC-U internal and external cladding available in the following configurations:

• Victorian/Georgian style (duo pitched) with roof pitches between 15° and 35° (see Figures 1 and 2).

Figure 1 Victorian style conservatory roof

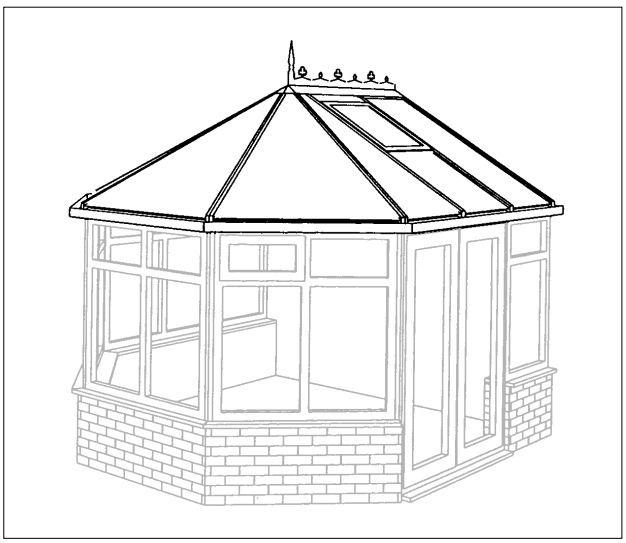
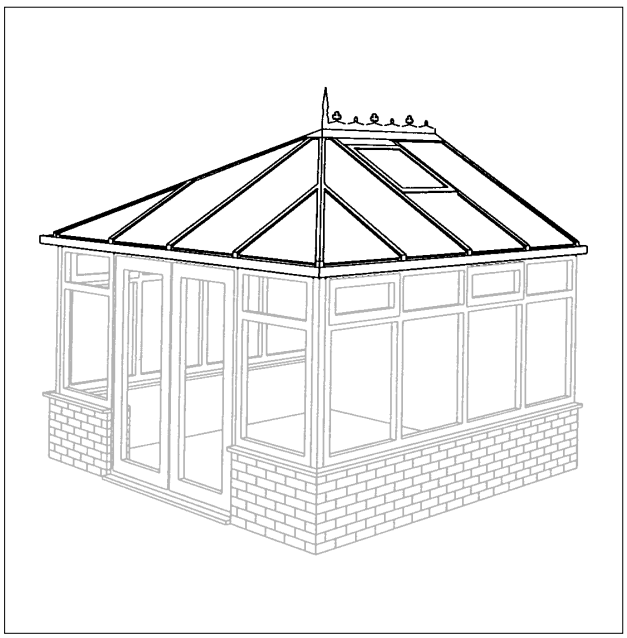


Figure 2 Georgian style conservatory roof



• Lean-to (mono pitch) Victorian style with roof pitches between 5° and 30° (see Figure 3).

• Combination 'P' shape (duo and mono pitched combined) achieved through a variable angle valley section (see Figure 4).

1.3 Permissible size parameters and configurations are described in the Ultraframe technical manuals; this Certificate relates to roofs used on conservatories not exceeding a floor area of 30 m^2 within these parameters.

Figure 3 Lean-to Victorian style conservatory roof

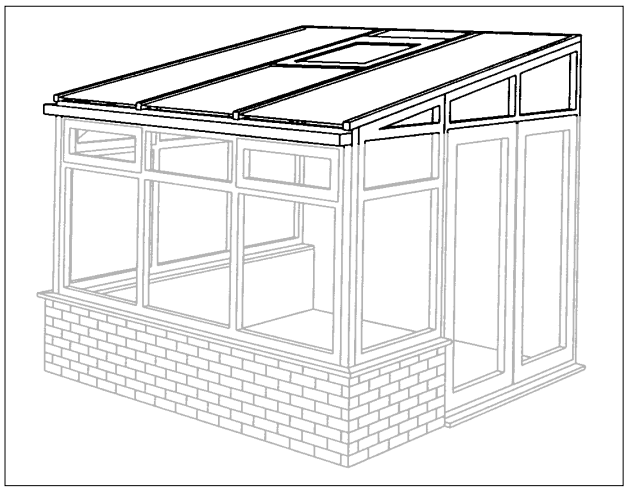
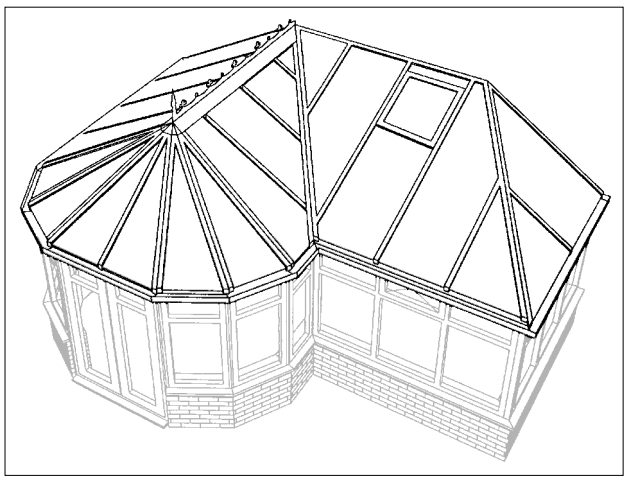


Figure 4 Combination style conservatory roof



1.4 The full specifications and drawings for the materials and components covered by this Certificate have been examined and are retained by the BBA. This section gives only general details of the system. A complete schedule of the component parts is contained in the Ultraframe technical manuals.

1.5 The roof system (see Figures 5, 6, 7 and 8) consists of a ridge beam member and glazing bar sections extruded from aluminium to BS 1474 : 1987, material designation 6063-T6, glazed with triple- or quadruple-wall polycarbonate panels or double-glazed sealed units. The units are of varying thicknesses, 16, 20, 24 and 28 mm, and kitemarked to BS 5713 : 1979. An aluminium eaves ring beam is attached to the supporting side wall structure with corner joints fixed with aluminium cleats and zinc plated screws.

1.6 Glazing bars with PVC-U internal cladding and TPE coextruded gaskets are attached to the eaves beam and ridge beam member with zinc plated steel bolts (captive in slots in the ridge and eaves beam aluminium extrusions). Hip bars are clamped onto the die-cast ridge end with Speedlok fixings. Starter glazing bars are attached to the ridge and eaves beams in the same manner as the transom glazing bars. The starter glazing bars are fixed directly to the existing building wall to provide lateral stability to the roof structure.

1.7 Glazing panels or units supported by the glazing bars are located into the ridge system through a PVC-U rain baffle and coextruded gasket providing a seal against ingress of moisture. External PVC-U caps with TPE coextruded gaskets snap into position on the glazing bars and hold down the roof panels or units, forming a seal between the internal and external gaskets.

1.8 To prevent the ingress of moisture a closed cell bung is positioned at the ridge end at the intersection of the hip bars and a silicone seal is applied to the joints.

1.9 An external PVC ridge cap with integral ridge flashing trim is positioned on top of the ridge body and is clamped in position from the inside with nylon fixing rods.

1.10 A PVC gutter system is attached to the aluminium eaves beam around the full perimeter of the roof using push-fit brackets. The underside of the gutter is finished off with a PVC trim or dentil moulding options. The internal face of the eaves beam and the ridge beam is clad with an internal PVC cladding.

1.11 Use of the Ultraquick ring beam system can give a quicker installation. The integral PVC-U extruded ring beam and gutter combination is reinforced with aluminium and jointed with special sections. A dentil moulding option finishes off the underside between gutter and walling frames.

1.12 An opening roof vent designed to match the glazing bar sections is available if required (see Figure 5).

Figure 5 Roof vent

Quality control

1.13 Quality control includes checks on all materials and components, in particular:

extruded PVC-U profiles

Fabrication of roof system

extrusions and components (visual inspection)
overall dimensions.

Figure 6 Cross-section through ridge

2 Delivery and site handling

2.1 Conservatory roofs are prefabricated in the factory. Components are marked and numbered to assist assembly. All components are suitably protected and delivered to site. Alternatively, fully assembled roofs can be supplied if required.

2.2 The conservatory roof has a label bearing the company's mark and the BBA identification mark incorporating the number of this Certificate.

2.3 The roof components should be stored under cover in a clean area and suitably protected to avoid distortion or damage.

Design Data

3 Strength and stability

3.1 The manufacturer's design code for the Ultraframe Victorian Conservatory Roof System is generally in accordance with the relevant requirements of:

BS 6399 : Part 3 : 1988
CP 3 : Chapter V : Part 2 : 1972
CP 118 : 1969.

3.2 Structural testing has been used to verify the relevant aspects of the manufacturer's design code.

3.3 A roof designed in accordance with the manufacturer's design code will have adequate resistance to wind loads calculated in accordance with CP 3 : Chapter V : Part 2 : 1972.

3.4 The roof is designed to support an imposed load of 0.75 kNm^{-2}. The magnitude of the actual snow load imposed will depend upon a number of factors, such as height above sea level, geographical location, roof size and arrangement. It is, therefore, recommended that BS 6399 : Part 3 : 1988 is used to calculate the actual snow load when the roof is used in areas where a load greater than 0.75 kNm^{-2} can be expected.

3.5 Details of the connections between the roof, the existing structure and the conservatory walls are dependent upon their type and condition. Guidance is available from the Certificate holder, or should be entrusted to a suitably qualified person.

4 Weathertightness

4.1 Selected samples from the roof system configurations covered by this Certificate were tested for weathertightness. There are no standards or guides applicable to conservatory roofs. Therefore, for the assessment, use was made of BS 6375 : Part 1 : 1989 and MOAT No 1 : 1974, giving the results shown in Table 1. The gradings are based on the assumption that the conservatory is installed in accordance with the Ultraframe technical manuals.

Table 1 Weathertightness[1]

	BS 6375 : Part 1 : 1989 Test pressure class (Pa)	MOAT No 1 Grading[2]
Watertightness	300	E_3

(1) A value for air permeability is not given as it will vary depending on the nature of the supporting walling structure.

(2) E_3 indicates water leakage occurring between 300 Pa and 499 Pa.

4.2 To achieve the gradings given in Table 1, particular attention must be paid to the correct fitting of all gaskets and weatherseals, and to the detailing of sealants and flashings.

4.3 The ridge and eaves trickle ventilators will help to equalise the internal and external air pressures.

5 Behaviour in relation to fire

5.1 The tempered safety glass used can be regarded as a non-combustible material and therefore can be taken as having a Class 0 performance rating.

5.2 The polycarbonate sheet used in the conservatory roof has achieved a Class 1 rating when tested to BS 476 : Part 7 : 1987 and is therefore classed as a TP(a) rigid thermoplastic. In Table 18 of Approved Document B to the Building Regulations 1991 (as amended 1994) (England and Wales) TP(a) rigid thermoplastics are allowed to be used in conservatory roofs.

5.3 The spread of flame across PVC-U is limited, and in a fire it will tend to char and may fall away. The use of the material in the construction of a conservatory roof would not accelerate the development of a fire.

6 Ventilation and solar heat gain

6.1 Trickle ventilation is provided through the ventilated ridge and eaves system (see Figure 7 for ventilated ridge). Additional background ventilation can be provided by the inclusion of controllable trickle ventilators in the head of window and door units where required.

6.2 Outward opening casement or tilt and turn lights can be included in the wall frame options to provide natural ventilation. The precise area of opening can be calculated. A habitable room may be ventilated through an adjoining conservatory if the ventilation openings have an area appropriate to Building Regulations requirements.

6.3 Opening roof vents can be included where required to provide greater levels of ventilation.

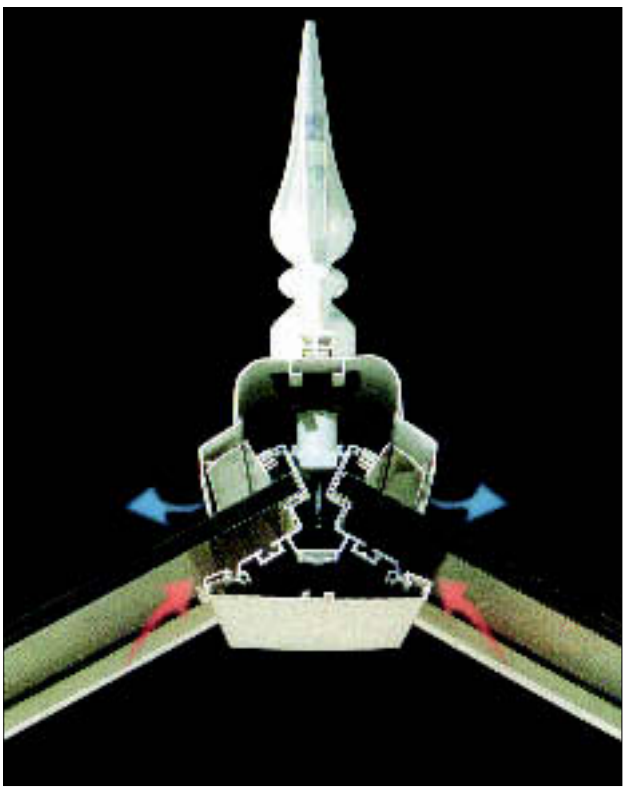
6.4 Solar heat gain through the roof panels and wall frames may provide a useful additional heat input during winter conditions; however, summertime internal temperatures will also be raised. To limit the latter effect, the following design factors should be considered:

- orientation with respect to south
- aspect ratio of the floor plan of the conservatory
- area of opening lights and doors to area of floor expressed as a percentage.

6.5 As an approximate guide, northerly facing conservatories should have opening lights or doors of not less than 15% of the floor area, rising to not less than 25% with roof blinds for those of a southerly aspect. This should limit the solar gain temperature rise to less than 12°C for most situations in summertime, using only natural ventilation. Where lower temperature rises are desired, consideration can be given to mechanical forced ventilation. More precise methods of design and solar data are given in *CIBSE (Chartered Institution of Building Services Engineers) Guide Book*, Parts A4 and A6.

6.6 To reduce the effects of solar heat gain on the internal temperature of the conservatory, blinds can be fitted (Victorian roof only), but their performance has not been assessed by the BBA.

Figure 7 Ventilated ridge



7 Condensation risk and thermal insulation

In common with all glazed roof structures, temperature reduction under night-time winter sky radiation conditions will lead to the possibility of condensation. However, the effects may be minimised by ridge and eaves ventilators and by the use of background heating to maintain the internal temperature between 3°C and 4°C above the external ambient temperature during winter night-time clear sky conditions. The U value of the triple wall polycarbonate roof sheets is calculated to be 2.4 $Wm^{-2}K^{-1}$ using CIBSE *Chartered Institution of Building Services Engineers Guide Book*, Parts A3.5 to A3.7. The glazing bars are assessed as having higher U values and consequently may be subject to occasional winter condensation under severe conditions, though the PVC-U cladding on the aluminium will minimise the effects. In general, if temperatures and humidities within the conservatory are maintained within the normal domestic band from 10°C to 25°C and from 40% to 65% RH, respectively, any occurrence of condensation will be slight and temporary.

8 Safety

8.1 Where a glass roof is specified, either sealed double-glazed units incorporating toughened safety glass kitemarked to BS 6206 : 1981, or laminated glass, is used.

8.2 The positioning of the hand operated controls of the opening vent will comply with the recommendations of BS 8213 : Part 1 : 1991.

9 Security against intrusion

9.1 Glazing sheets are retained by glazing bar top cappings. Removal of glazing bar top cappings is extremely difficult without use of a special tool.

9.2 The roof light is fitted with a screw closing mechanism and provides reasonable security against unauthorised entry by the opportunist intruder.

9.3 It is recommended that a conservatory forming an extension to an existing dwelling should retain a lockable exterior type door to the main building.

10 Ease of operation

The roof vent can be operated without difficulty when correctly installed in the conservatory roof.

11 Maintenance

11.1 The conservatory roof can be re-glazed and the gaskets replaced, but these operations should be carried out using the materials supplied by the Certificate holder or Ultraframe (UK) Ltd and approved by the BBA.

11.2 If damage occurs to a roof vent, the furniture and fittings can be readily replaced by releasing the fixing screws and changing the fitting.

11.3 The PVC-U internal and external claddings can be cleaned using water containing household detergent. If dirt is allowed to build up on the members over long periods it may become more difficult to restore the surface appearance.

11.4 Care should be taken when using proprietary materials for cleaning the glazing to ensure that deposits are not allowed to remain on the PVC-U where they may cause discolouration and damage to the surface. In addition, care must be taken to avoid damage to, or discolouration of, the members when stripping paint from adjacent

surfaces, for example, by means of a blowlamp, paint stripper or mechanical stripper.

11.5 Paints can adversely affect the impact strength of the PVC-U cladding and the application of dark colours could lead to a risk of thermal distortion. Therefore painting is not recommended.

11.6 The roof vent locking mechanisms and hinges should be lubricated periodically to minimise wear and to ensure smooth operation, as recommended by Ultraframe (UK) Ltd.

11.7 The roof panels can be readily replaced, if damaged, by removal of the glazing bar top capping using a special tool. Cleaning should be carried out using water containing household detergent. To avoid scratching of the surface, only soft cloths should be used when cleaning.

12 Durability

12.1 Evidence is available on the performance in the UK of PVC-U similar to that used for the internal and external cladding, over a period of 15 years in windows and in excess of 20 years in other external applications. Such evidence, when compared with the results of tests on the Ultraframe PVC-U, indicates that the conservatory roof will have a life of at least 25 years. Slight colour change or surface dulling may occur within the overall life of the roof.

12.2 Polycarbonate roof sheets, aluminium glazing bars and other components, including the roof vent hinges, and locking mechanism, will have similar durability. Where conservatory roofs are to be installed in areas subject to particularly aggressive conditions, for example, in coastal locations or near sources of industrial pollutants, replacement of components may be necessary within the life of the conservatory roof. Polycarbonate roof sheet replacement may be necessary where prolonged exposure to direct sunlight causes degradation.

12.3 The gaskets and silicone sealant may need to be replaced within the life of the conservatory roof.

Installation

13 General

13.1 Design and manufacture of the conservatory roof system is undertaken by the Certificate holder in accordance with the Ultraframe technical manuals.

13.2 Cavity trays are required where the conservatory roof abuts the wall of the building for new construction and consideration is given to their inclusion in existing walls in exposed situations.

13.3 When the pitch of the building roof adjacent to the conservatory is steeper than 45° consideration should be given to the inclusion of snow guards. This will prevent the worst effects of snow slides and dropping debris.

14 Preparation

14.1 All supporting side frames incorporating window profile material, ie PVC, timber or aluminium, should be designed in accordance with the relevant British Standards for imposed loadings. The side frames/walls must provide conservatories with overall lateral stability and resistance to axial loading. Advice should be sought from the frame supplier for the specific use of members for the conservatory construction with due consideration given to the recommended packings between glazing and framework.

14.2 Foundations must meet the requirements of BS 8004 : 1986, *NHBC Standard*, Chapter 4 : 1992 and *Zurich Municipal Technical Manual*, Section 2, where applicable. Consideration should be taken of local conditions and advice sought from the local authority when necessary. If there are any doubts with regard to the stability of a site, a suitably qualified engineer should be consulted.

15 Procedure

15.1 The eaves beam is positioned on top and in line with the supporting side frames and secured using the recommended fastener and fixing centres. The corner joints are spliced with aluminium cleats and fixing screws.

15.2 The ridge beam is placed in position and located with the starter glazing bars, hip bars and transom bars. The hip bars with Speedlok fixings are clamped to the die-cast ridge end (see Figure 8), and to the eaves beam by captive bolts located in the eaves beam extrusion. Starter glazing bars and transom bars are attached to the ridge section and to the eaves beam by captive bolts located in the ridge and eaves beam extrusions.

15.3 The starter glazing bars are fixed directly to the existing house wall using appropriate fixings.

15.4 The roof is glazed with polycarbonate sheets or sealed double-glazed units. Each panel is located into the ridge system between the PVC rain baffle and the coextruded TPE gasket. External glazing caps with coextruded TPE gaskets are snapped onto the glazing bars to form a seal against the glazing panel.

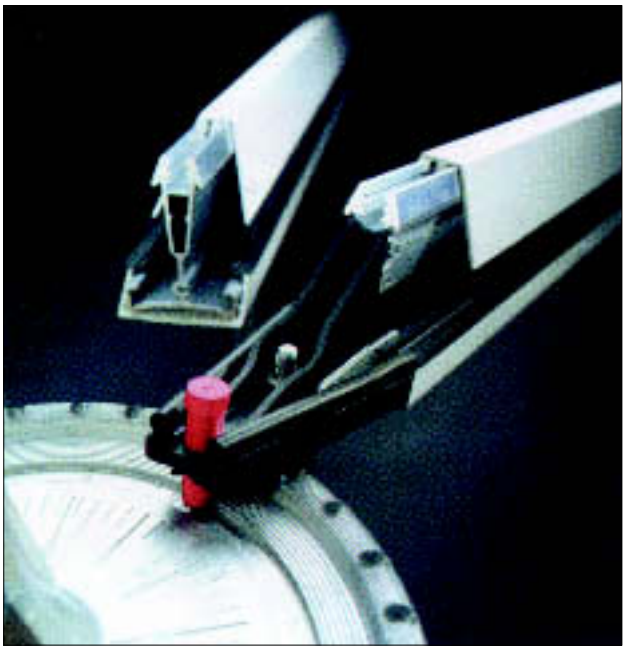
15.5 A closed cell foam bung is positioned at the ridge end of the intersection of the hip bars and a silicone seal is applied to the joints. The PVC ridge cap is clamped into position from inside.

15.6 Lead flashing is fitted at the abutment of the roof to the house wall.

15.7 The installation is completed by fitting such items as trims, ridge cresting, finials, gutters (except

for Ultraquick), and downpipes. Rainwater is directed to a suitable soakaway or drain.

Figure 8 Speedloks clamped to glazing bars, which are fixed to the die-cast ridge end



Technical Investigations

The following is a summary of the technical investigations carried out on the Ultraframe Victorian Conservatory Roof System.

16 Tests

Tests were carried out to determine:

watertightness
effect of wind loads
effect of snow loads
suitability of materials.

17 Other investigations

17.1 The manufacturer's design code was examined for compliance with:

BS 6399 : Part 3 : 1988
CP 3 : Chapter V : Part 2 : 1972
CP 118 : 1969.

17.2 Computer predictions of structural performance were compared to those obtained from full-scale testing.

17.3 A user survey was conducted to establish the product's ease of installation and performance and durability in service.

Bibliography

BS 476 *Fire tests on building materials and structures*
Part 7 : 1987 *Method for classification of the surface spread of flame of products*

BS 1474 : 1987 *Specification for wrought aluminium and aluminium alloys for general engineering purposes: bars, extruded round tubes and sections*

BS 5713 : 1979 *Specification for hermetically sealed flat double glazing units*

BS 6206 : 1981 *Specification for impact performance requirements for flat safety glass and safety plastics for use in buildings*

BS 6375 *Performance of windows*
Part 1 : 1989 *Classification for weathertightness (including guidance on selection and specification)*

BS 6399 *Loading for buildings*
Part 3 : 1988 *Code of practice for imposed roof loads*

BS 8004 : 1986 *Code of practice for foundations*

BS 8213 *Windows, doors and rooflights*
Part 1 : 1991 *Code of practice for safety in use and during cleaning of windows and doors (including guidance on cleaning materials and methods)*

CP 3 *Code of basic data for the design of buildings*
Chapter V *Loading*
Part 2 : 1972 *Winds loads*

CP 118 : 1969 *The structural use of aluminium*

MOAT No 1 : 1974 *Directive for the Assessment of Windows*

On behalf of the British Board of Agrément

Date of issue: 31st March 1998

Director

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